REMARKS

The present invention relates to a pressure sensitive adhesive composition.

In the non-final Office Action dated January 27, 2009, it is first of all appreciated that the Examiner has withdrawn the previous rejection under 35 U.S.C. § 102(b) based on U.S. Patent 4,463,115 (Hirose). However, the rejection under 35 U.S.C. § 112 was maintained, with the Examiner's response to Applicant's arguments set forth at pages 2-3 of the Office Action; at page 3, the Examiner has furthermore noted that Production Example 3 contained an apparent nomenclature error, and the Examiner indicated possible corrections. Furthermore, claims 1, 3, 4 and 7 were rejected under 35 U.S.C. §103(a) based on Hirose.

In response to the Office Action, Applicant has herein amended the specification and claims responsive to the remaining rejections.

First, Applicant has amended to specification to correct the nomenclature in accordance with the Examiner's suggestion.

Second, Applicant has herein amended claim 1 to incorporate claim 3, defining the compounding ratio of the tackifier resin (B) per the parts by weight of the polymer (A). Accordingly, claims 3 and 5 have been canceled. Minor amendments to improve grammatical clarity have also been made, including to claims 4, 6, and 7.

For the reasons explained in further detail below, Applicant respectfully submits that the claims as amended hereinabove are unobvious and patentable over the Hirose reference.

Preliminarily, concerning the last paragraph on page 3 of the Office Action, Applicant would like to clarify the Examiner's understanding of the Production Examples.

Particularly, the unit "equivalent" is the amount of the hydrolyzable silyl groups introduced into and occurring in the oxyalkylene polymer relative to the total amount of the functional group which allows introduction of the hydrolyzable silyl group (see, e.g., page 7, lines 18 to 24 of the specification).

In Production Example 1, the indication that "all the unsaturated groups were reacted with 0.6 equivalent of methyldimethoxysilane" does not mean that the unsaturated groups were completely modified. It means that 0.6 equivalent of silane, namely, less than a stoichiometric amount of silane, relative to all the unsaturated groups, was reacted with the unsaturated groups. Those skilled in the art can readily understand that not all of the unsaturated groups were modified.

The present invention

The present invention is directed to a pressure sensitive adhesive composition which comprises oxyalkylene polymer (A), tackifier resin (B) and curing catalyst (C). Controlling both the hydrolyzable silyl group content and the number average molecular weight of the oxyalkylene polymer (A) is important to achieving a large adhesive strength.

The effect of the present invention is clear from the Examples and Comparative Examples of the present application, as seen below.

	Example 1	Example 2	Comparative Example 1	Comparative Example 2
Mn of polymer	31,000	31000	10800	31000
Hydrolyzable silyl group (equivalent)	0.6	0.4	0.75	0.8
Tackifier resin	80	50	80	80
Toluene	40	0	0	40
Adhesive strength (N/25 mm)	55.2	36.0	9.2	29.8

Comparing Example 1 with Comparative Example 2, both of which use toluene, the adhesive strength of Example 1 is almost twice as high as that of Comparative Example 2. The difference is attributable to the difference of hydrolyzable silyl group content.

Comparing Example 2 with comparative Example 2, the adhesive strength of Example 2 is larger than that of Comparative Example 2.

The composition of Example 2 does not contain toluene, but it can be seen that a larger adhesive strength is obtained when hydrolyzable silyl group content is within the claimed range even if less amount of tackifier resin is used.

Comparing Comparative Example 1 with Comparative Example 2, it is clear that the adhesive strength also depends on the number average molecular weight of the oxyalkylene polymer.

Comparing Example 2 with Comparative Example 1, the adhesive strength of Example 2 is almost four times as high as that of Comparative Example 1, even though Example 2 uses less amount of tackifier resin. The difference is attributable to both the hydrolyzable silyl group content and the number average molecular weight of the oxyalkylene polymer (A).

These comparisons show that it is necessary to satisfy both the hydrolyzable silyl group content and the number average molecular weight of the oxyalkylene polymer (A) to obtain a high adhesive strength in accordance with the present claimed invention.

Rejection under 35 U.S.C. § 103(a)

Hirose is directed to a pressure sensitive adhesive composition comprising (A) a polyether having at least one silicon-containing hydrolysable group and (B) a tackifier. Hirose teaches that the molecular weight of the polyether is 300 to 30,000, preferably 3,000 to 15,000 (col. 3, lines 5 to 6).

In Reference Example 1 of Hirose, the average molecular weight of the obtained polyether is 8,200, far below 20,000 (see col. 5, lines 34 to 36), and the hydrolyzable silyl group content of the polyether is about 0.9 equivalent (82%/90%). The polyether of Reference Example 2 has similar features. In Reference Example 3, the hydrolyzable silyl group content of

the polyether is about 0.6 equivalent (55%/90%), but the average molecular weight of the polyether is about 8,200. Hirose does not teach or suggest to control both the hydrolyzable silyl group content and the number average molecular weight of the polyether within the claimed range. As already discussed, either the small molecular weight of the polymer, or the large hydrolyzable silyl group content decreases adhesive strength, not to mention a combination of both.

Concerning the amount of the tackifier resin, Hirose uses various amounts of tackifier to optimize the amount (Tables 2 and 3). In every Hirose composition, 100 parts of tackifier relative to 100 parts of polyether provides the maximum adhesive strength. From the teaching of Hirose, those skilled in the art would understand that 100 parts of tackifier is the optimum amount.

On the other hand, the composition of the present invention contains at most 80 parts by weight of tackifier resin per 100 parts by weight of the polymer (A). The composition of the present invention does not require a large amount of tackifier resin since both the hydrolyzable silyl group content and the number average molecular weight of the polyether are controlled within the claimed range. When a large amount of tackifier is used, affinity for various adherends, hydrophilicity, and chemical stability of the oxyalkylene polymers are deteriorated (page 2, lines 1 to 5). The present invention prevents these deteriorations.

As discussed above, the adhesive strength is increased and the amount of tackifier resin is reduced by controlling both the hydrolyzable silyl group content and the number average

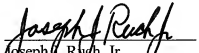
molecular weight of the polyether within the claimed range. Those skilled in the art would not be motivated by Hirose to control both of the values, and the effects of the present invention are not predictable from Hirose. Accordingly, the present invention is not rendered obvious over Hirose.

In view of the above, reconsideration and allowance of pending claims 1, 2, 4, 6 and 7 of this application are now believed to be in order, and such actions are hereby earnestly solicited.

If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned attorney at the local Washington, D.C. telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



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Date: April 27, 2009